

**A Magyar Élettani Társaság, a Magyar
AnatómusokTársasága, a Magyar Biofizikai
Társaság és a Magyar Mikrocirkulációs és
Vaszkuláris Biológiai Társaság Kongresszusa**

2012. június 10-13.

Debrecen

Absztraktfüzet

Cluster analyses of MEMs grouped all matrices correctly by neuron types if MEMs were computed in homogeneous soma-dendrite models with steady-state current inputs. In all other cases (inhomogeneous models with both steady-state and sinusoidal current inputs and homogeneous models with sinusoidal current inputs) 14 out of 15 neurons were correctly classified based on their MEMs.

We conclude that morphoelectrotonic matrices are sensitive tools to map the architecture of the whole dendritic surface and they can discriminate between different neurons with high confidence.

This work was supported by the grants OTKA K67747 and ETT 025/2006.

¹Csilla Somogyi, ¹Csaba Matta, ¹Zsófia Földvári, ¹Éva Katona, ¹Roland Ádám Takács, ¹Tamás Juhász, ²Bence Hegyi, ²Norbert Szentandrassy, ¹Róza Zákány

HEALTH SCIENCE CENTRE ¹Department of Anatomy, Histology and Embryology,
HEALTH SCIENCE CENTRE ²Department of Physiology

VANILLOID RECEPTOR TYPE 1 (VR1) ION CHANNEL EXPRESSED ON DIFFERENTIATING AVIAN CHONDROCYTES

Though, chondrocytes are non-excitable cells, they express a large set of ion channels (e.g. P2X₄, NMDARs, Kv channels) maintaining a dynamic relationship with the low pH and hypoxic extracellular environment. The role of these channels in embryonic cartilage formation is of our major interest. Transient Receptor Potential Vanilloid (TRPV) subfamily of non-selective cation channels of plasma membrane has not been studied in a detailed way during chondrogenesis, except TRPV4 activity that contributes through the Sox9 pathway in the process of chondrogenesis.

Our experimental model is a primary chondrogenic high density cell culture system (HDC) established from cells isolated from limb buds of 4-days-old chicken embryos. Spontaneous cartilage formation occurs in 6 days in HDC. Cells of HDC express mRNAs of various TRPV members during the course of cartilage differentiation but primarily we focused on the polymodal TRPV1 membrane receptor. We were unable to detect TRPV1 protein expression at the expected 90-100 kDa range but found certain bands lower to the expected in specimens from chicken articular cartilage or samples from chicken HDCs, as well as in chicken brain and dorsal root ganglia, applied as positive controls in Western blots. Avian TRPV1, similarly to its mammalian variants is a dominantly calcium selective ion channel and is sensitive to heat stimulus and low pH but is insensitive to capsaicin or related pharmacological modulators as it contains a rudimentary capsaicin-binding region. In order to activate TRPV1, we applied 30 min heat treatment on chicken HDCs on culturing days 2 and 3, which period is characterized by commitment of chondrogenic cells to matrix producing chondroblasts. This intervention caused bimodal effect on cartilage formation: 41°C significantly promoted, while 45 °C slightly decreased it. Intracellular calcium concentration was elevated by heating, although this raise of calcium concentration did not require the presence of extracellular calcium. This observation needs further investigations.

Supported by grants: OTKA CNK807809 and Mec-9/2011.

¹Roland Ádám Takács, ¹Csaba Matta, ¹Tamás Juhász, ¹Éva Katona, ¹Csilla Somogyi, ¹Ádám Papp, ²Gergely Pál, ¹Róza Zákány
MAT ¹Debreceni Egyetem OEC, Anatómiai, Szövet és Fejlődéstani Intézet,
MAT ²Debreceni Egyetem OEC, Orvosi Vegytani Intézet